

A Critical Study of Victorian Approaches to the Problem of Perception in Gerard Manley Hopkins' Poetry

Dr Veena Ilame

Assistant professor, Department of English, Anna Saheb Gundewar College, Katol Road, Nagpur, Maharashtra, India
Email: veenailame@gmail.com

Abstract— This article addresses how Hopkins's concept of inscape interacts with issues of Perception in 19th-century scientific discourse. The researcher addresses the problem of attention, a tool deemed essential for scientists during this period. Attention can be defined as an act of will toward an object of Perception that will overcome subjective conclusions and produce more reliable, objective knowledge. In this essay, The paper considers how attention influenced the development of Hopkins's inscape and demonstrate how four poems, "The Candle Indoors," "The Lantern Out of Doors," and the sonnets "The Windhover" and "As kingfishers catch fire," attempt to solve the problems of sustaining attention to achieve actual knowledge about both the physical and the metaphysical reality contained within God's creation.

Keywords— attention, Gerard Manley Hopkins, metaphysics, Perception, science, Victorian.

I. INTRODUCTION

The Victorian Age witnessed the emergence of conflicting ideas that affected the interpretation of the visual world. The first was an increasing reliance on scientific observation and its ability to gather objective data from the external world; the second was an increasing awareness that visual observation was subjective and particular to the individual observer. In an untitled poem, Gerard Manley Hopkins directly addresses the paradox that Perception created for the Victorian. The science of Perception influences Hopkins's subject; the poem discusses rainbows, a topic that was much discussed by natural philosophers and

Those interested in the physiology of Perception, unusually light and colour theory.¹ The poem reads,

It was a hard thing to undo this knot.

The rainbow shines, but only in the thought

Of him, that looks. Yet not in that alone, For who makes rainbows by invention?

And many standing around a waterfall See one bow each, yet not the same to all,

But each a hand's breadth further than the next.

The sun on falling waters writes the text

Which yet is in the eye or the thought.

It was a hard thing to undo this knot. (29)

The poet directly adopts the subjective Perception of rainbows as his theme. Two observers may each see a rainbow, but each "sees one bow" and it is "not the same to all." The rainbow cannot reside, however, solely in the individual's imagination, for no one "makes rainbows by the invention." Something objective, something external to the observer, does exist to be seen, but it is inextricable from subjective Perception. The opening and closing lines, however, suggest that the speaker has come to a resolution. He states that "it was a hard thing to undo this knot," not "it is a hard thing." Although the solution is not stated (and is far from satisfactory),² scientific discourse provided Gerard Manley Hopkins with a language with which to discuss the problems of Perception.

Gerard Manley Hopkins, like many Victorian writers, took advantage of the detailed observation that science encouraged to write more accurately about the world around him. His writings about Perception during his time at Balliol and in the few years after he left Oxford show a thinker determined to consider Perception from many angles of inquiry, including the scientific. From 1864 to 1883, Hopkins seeks a balance between the material and the metaphysical: Perception is neither a passive action of

physiology nor is it entirely a product of the subjective mind. I should clarify that I am using the term “metaphysics” as it would have been used in many Victorian discussions of Perception; the metaphysical is that which is beyond the physical. In other words, a strict materialist would define anything that cannot be observed through physiological sensation as a part of metaphysics, including any action of the mind in Perception. Although Hopkins does incorporate metaphysics into his discussions of Perception, his writings still show an attraction for arguments that depend upon physiology.³ Hopkins’s Balliol education and his undergraduate essays demonstrate his ability to approach contemporary scientific discussion intelligently. Several of the poems and prose writings that emerge from this period at Balliol and in the few years following demonstrate that Hopkins was concerned with how varying theories of sensation and perception⁴ affected knowledge acquired through vision. This article will address the two undergraduate essays, “The Probable Future of Metaphysics” and “The Tests of a Progressive Science,” to demonstrate how Hopkins more formally entered scientific discussion while in school. Specifically, in “The undergraduate influence,” The analysis will discuss how Hopkins offers a critique of pure materialism and upholds the role of the subjective mind; at the same time, Hopkins acknowledges that physiology does play an essential part in Perception—he seeks a balance between purely physiological and purely subjective theories of Perception and asserts that physiology works in concert with the mind. The paper will also briefly address Hopkins’s concept of inscape and instress, his idiosyncratic approach to Perception that he developed concurrently with undergraduate essays. Inscap and instress offer ways that Perception can affirm both the external world while acknowledging that which is beyond physiology and the material (or the metaphysical). Successful inscape, however, requires enormous amounts of attention, a method of intense observation that scientists relied upon for accurate Perception. The remaining two sections of the essay (“Light and the mind: ‘The Lantern Out of Doors’ and ‘The Candle Indoors’” and “Catching fire: ‘The Windhover’ and ‘As kingfishers catch fire’”) will concentrate on Hopkins’s growing mistrust of the power of attention as demonstrated in sonnets written after Tyndall’s infamous “Belfast Address” (1874) and before Hopkins’s last letter to the journal *Nature* (1884). The distrust of attention turns Hopkins towards a reliance on the divine, the supremely metaphysical. He negotiates a delicate balance between the physical and the metaphysical that affirms the role of each in Perception.

A very brief definition of the spectrum of Victorian responses to the problems of Perception that Hopkins addresses are helpful. The researchers who endeavoured to respond to Perception often confronted these physiological developments from positions that appear incredibly unusual today. Science and natural philosophy incorporated many disciplines, not all of which would be recognised by modern science. When the Academy announced on February 14, 1874, that it would devote one-quarter of its pages to “Scientific Matters,” it indicated that this “Science” section would “embrace Natural Philosophy, Theology, and the Science of Language” (188). The problems of Perception were addressed from physiology, from the developing science of psychology, from theology, from philosophy, and philology. Discussions often centred on whether Perception provides any objective knowledge regarding the external world. Commenting on the subjectivism that all but the most conservative theories allowed to inhabit Perception, Richard F. Clarke wonders in *The Month* whether it is ever possible to escape the “magic circle of self” (202). Is the human mind locked within its subjective interpretation of the world? Despite the different methods of engaging the problem, two basic approaches to Perception may be identifiable: one based primarily in more philosophical discussions and the other in the scientific materialism that was rapidly becoming the dominant discourse in Perception.

Both philosophical and more materialist positions were strongly influenced by each other; in fact, the moderate positions within both were often very similar. Within more philosophical discussions, the extremely conservative theorists located Perception entirely within the mind, asserting that there can be no right objective knowledge gained from external reality.⁵ While continuing to assert that Perception occurs within the mind, however, most philosophical commentators ultimately rejected the idea that the external world may not be objectively observed and laboured to reconcile this idea with recent advances in science.⁶ The more materialist theories fully embraced the implications of a science that was increasingly relying on interpretations of the world that were entirely material or physical, rather than metaphysical. Paradoxically, some of these thinkers often came to similar conclusions as to the most conservative philosophical thinkers and concluded that the external world might never be objectively perceived. Instead of asserting that the process of Perception lies within the mind, however, these scientists located Perception within physiological sensation; however, the flawed physiological means by which the human views the world forever taints accurate perception.⁷

Moderate positions, whether philosophical or materialist, insisted that something external to the senses existed objectively, while also acknowledging the powerful influence of subjective interpretation. As Hopkins's writings demonstrate, arguments based in physiology maintained a strong influence on his thinking about Perception.

II. THE UNDERGRADUATE INFLUENCE (1867–88) THE PRIMARY SIGNIFICANCE OF THE SUBJECTIVE MIND IN PERCEPTION:

It will always be possible to shew how science is atomic, not to be grasped and held together, “scope less,” without metaphysics: this alone gives meaning to laws and sequences and causes and developments—things which stand in a position so peculiar that we can neither say of them they hold in Nature whether the mind sees them or not nor again that the mind founds them because it first put them there.

(“The Probable Future of Metaphysics” JP 118)

In “The Probable Future of Metaphysics” (1867), Hopkins attempts to reconcile metaphysics with a current scientific theory that deemphasises or completely denies the importance of metaphysical thinking. He responds directly to the physiologists that were contributing to the theories of scientific materialism—theories based upon the belief that the study of the material world, was the only reliable road to knowledge. Hopkins counters that these beliefs are “short-sighted”: “Material explanation cannot be refinable into explaining thought, and it is all to no purpose to show an organ for each faculty and a nerve vibrating for each idea” (JP 118). Hopkins is attacking a “purely material psychology” that seems to be threatening any study of metaphysics (JP 118). Although Hopkins's argument addresses a specific discipline, the emerging science of psychology, Hopkins's argument here reflects that of William Whewell's more general criticism of an overemphasis upon physiology within specific sciences.⁸ Whewell acknowledges that “the fundamental principles of several sciences depend upon the assumption of a medium of perception,” but “these principles do not at all depend upon any special view of the process of our perceptions” (284). Physiology is “extraneous” and may in fact “mislead the inquirer” (285). Just as Hopkins indicates the futility of finding a “nerve vibrating for each idea” within psychology, Whewell contends that “no anatomical analysis of the corporeal conditions of vision, or hearing, or feeling warm, is necessary to the sciences of Optics, or Acoustics, or Thermotic” (285). These sciences depend more on theories governing wave motion rather than upon

strictly physiological considerations. Hopkins contends in this essay that it would be impossible for a purely material science to explain all phenomena because it would first have to “resolve force and matter into one thing and then afterwards to approach that which to all appearance alone has the power of disposing of force itself, that is mind, and subsume that too under the head of the material” (118). Even if scientific materialism, or “physical science and Positivism,” are indeed led by “the ideas Fact and Law,” a supposition Hopkins appears to affirm without argument, its “most formal expressions are half physical and concrete” (119). Hopkins clearly states that the positivists address only part of the equation; the mind, and by extension, its function in Perception, only relies in part upon the physiological sensations that it receives.⁹ Perception may be analysed physiologically, but such an analysis will never yield a complete picture of Perception. “Laws and sequences and causes and developments” demonstrate the significance of the subjective mind. They are “things which stand in a position so peculiar that we can neither say of them they hold in nature whether the mind sees them or not nor again that the mind founds them because it first put them there” (JP 118). Abstract thought and the workings of the subjective mind, avoided by the positivists and materialists as metaphysical, are necessary to give meaning to the laws and sequences used to study the natural world.

Hopkins's undergraduate essay, “The Tests of a Progressive Science” (1867), further emphasises the limitations of knowledge gained by observation of the physical world alone. In this essay, Hopkins focuses on the development of scientific theory and method over the mere fact-gathering that observation may encourage. Observation alone does not lead to genuine progress in science: “the observation of parthenogenesis in aphides two generations longer than had before been found possible shews little progressiveness” (181). This sort of observation simply adds more data but does not significantly change biology. Instead, science is best served by “widening its connection” or by an “extension of class-division over a field lying on the outskirts of science” (181). When the mind begins to extend the application of science, when it makes new connections, observation may lead to actual progress. The example Hopkins gives of continuous observation comes from optics: “the spectral analysis by which the chemical composition of non-terrestrial masses is made out is a development of optics which cannot be called supplemental but a complete widening or alteration of its beat” (181). The discovery of spectral analysis extends the contribution of optics; both chemistry and astronomy

benefit. It is the sort of science for which Hopkins had the most respect—the scientist was making connections with his mind. Whether it was progressing in science or Perception, Hopkins insists upon considering the influence of a subjective mind in interpreting objective facts.

According to Whewell, observation could still be relied upon despite the influence of the subjective mind. The mind was, in fact, necessary for ordering and making sense of sensations so that they could be perceived as knowledge. The eyes, for example, allow “various shades and colours and shapes” to be seen, but “the outlines by which they are separated into distinct objects of definite forms, are the work of the mind itself” (Whewell 25). Hopkins makes these distinctions within language as well. In his “Notes on the history of Greek Philosophy,” he defines the word as “the uttering of the idea in mind”. He then proceeds to divide the “idea” into “the image (of sight or sound or scapes of the other senses), which is physical and refined energy accenting the nerves, a word to oneself, an inchoate word, and secondly the conception” (JP 125, emphasis in original). Even within a word, mind and sensation come together to present the whole idea. The mind possesses an “energy” that accents the nerves and so completes the process of Perception.

III. PHYSIOLOGICAL PERCEPTION AND THE EXISTENCE OF AN EXTERNAL WORLD:

...it seems reasonable to suppose impressions of sight belong to the organ of sight...(Journal entry on December 23, 1869, JP 194)

Although knowledge of the external world is interpreted and formed by the subjective mind, this does not suggest that the external world is entirely within the mind or even that the mind is in complete control of the data received by sensations. The subjective mind structures knowledge into a form, like a word within Hopkins’s discussion of language, that permits analysis; however, some sensations occur beyond the full control of the subjective mind. Hopkins’s note within “Notes on the history of Greek Philosophy” makes confident that there is a distinction between the image deliberately formed by the mind and the involuntary image sensation produces within the sense organs “from without” (JP 125). The image contained within the word is part of the mind’s interpretive process and is deliberately called forth. The physiological sensation may produce images that are the “involuntary working of nature” (125).

In this same note, Hopkins curiously places images in dreams as an additional example of the “involuntary working of nature” (125). Dreams would seem to suggest

the workings of a subjective mind, but Hopkins seems to interpret them as afterimages of sensation. In other words, the subjective mind is working with the images produced through sensation by the external world. The mind deliberately recalls the images, but they are not created there. An 1869 journal entry more fully explores the origination of images found in dreams. Despite Hopkins’s seeming indifference to the importance of physiology in essays like “The Probable Future of Metaphysics,” the journal relies upon physiology to explain the images brought before the mind. Hopkins is indeed open to physiological explanation, perhaps more so than are writers like Whewell; it is apparent that the undergraduate essay criticises extreme approaches that limit Perception either to physiology or to abstract theories of mind. In his journal, Hopkins finds that there is a difference between dream images and those “brought by the ordinary use of the function of sight” (JP 194). The images in dreams “appear to have little or no projection, to be flat like pictures, and often one seems to be holding one’s eyes close to them.” There is a difference between images formed through the senses and those formed, or even recalled, by the mind. These images are not, however, independent from images formed by the eye; Hopkins describes these images as a ghost of the previous sensation. He speculates that these images are created “by a reverse action of the visual nerves” for “it seems reasonable to suppose impressions of sight belong to the organ of sight.” The images have been “stalled”—or stored—by the mind. Interestingly, the mind may not create them

“at will” when awake,

for the real effort and advertence would be destructive to them since the eye in its sane waking office kens only impressions brought from without either from beyond the body or from the body itself produced upon the dark field of the eyelids. (JP 194)

The functioning eye knows only that which stimulates it from beyond the body—the mind cannot force the eye to recall any image at will when the body is awake. The active visual sensation works in concert with the mind; the mind and vision do not act separately without one becoming “destructive” to the other. Hopkins does allow that occasionally the mind does bring forward images involuntarily, but these are “coarser and simpler, and something like the spectra made by bright things looked hard at.” Immediate sensation of an image is different from the image when recalled by the mind. The physiological process remains essential to Perception.

Hopkins ends this passage with a statement that succinctly answers one of the difficulties of both scientific and more

philosophical analyses of the Problem of Perception. If the mind and the sensations are so intertwined, how is it possible that the mind can distinguish the difference between that which is outside of the mind and that which is not? How does one make an accurate distinction between the objective and the subjective? Hopkins uses an analogy from optical physiology to resolve the issue:

It is not, in reality, harder for the mind to have ken at the same time of what the eye sees and also of the belonging images of our thoughts without ever or almost ever confounding them than it is for it to multiply the pictures brought by the two eyes into one without ever or almost ever separating them. (JP 194)

Hopkins states that the mind can be aware of both the physiological image and the “belonging,” or corresponding, images within the mind without confusing them. Hopkins is as comfortable with this paradox as the one which explains the binocular vision. The use of a physiological explanation assists him in accepting that the relation of physiology and mind are indistinguishable within Perception even if it is possible to discuss them separately. The conscious mind is unaware of the dual images binocular vision necessitates; it is always seen as a single image unless something intervenes to make the dual images apparent. It is still possible to understand that binocular vision is a fact, even if it is difficult to separate the two inexperience. Hopkins finds in this fact of optical physiology the analogy he needs to express the unified experience of mind and physiology within Perception

Parmenides mention them in the context of establishing a reality beyond the confines of the mind. Hopkins describes the connection between the mind and the object as the stress expressed by instress and inscape. He indicates that without stress there

would be no bridge, no stem of stress between us and things to bear us out and carry the mind over: without stress, we might not and could not say/ Blood is red/ but only/ This Blood is red/ or/ The last Blood I saw was red/ nor even that, for in following language not only universals would not be real but the copula would break down even in particular judgements. (JP 127)¹¹

Hopkins’s notes show him using Parmenides’ thought to clarify further how one comes to recognise universal truths about the external world, despite being expressed and given form by the subjective mind. Universal statements such as “blood are red” would be impossible without some bridge between the mind and an object. Hopkins finds this bridge in stress and expresses it through inscape and instress. Inscaperefers to that within an object that expresses its uniqueness. Instress identifies the stress that upholds an object’s inscape or the stress that allows an object’s inscape to be made known.¹² A lack of inscape is equivalent to a lack of being and “not-being” is, in Parmenides as interpreted by Hopkins, “a waste space which offers either nothing to the eye to foredraw or many things for drawing away from one another” (129). Thus, Being, the reality or uniqueness of the object, involves something offered to the eye that can be “fore drawn” by the mind. Again, the union of the subjective and the physiological is shown to be present in Perception without a loss to external reality. The use of the word “fore drawn” also suggests tension, in the sense that something is either being drawn apart or drawn together.¹³ The fact that one does know, or recognise, or name an object proves its existence (“To be and to know or Being and thought are the same,” 129).

The process of recognising inscape and instress requires an enormous amount of attention to develop knowledge about the objective world. Briefly, attention can be viewed as an act of will toward the object of Perception. The observer makes a conscious effort to contemplate an object.¹⁴ Attention was seemingly necessary for all acts of Perception. Helmholtz in “The Physiological Causes of Harmony in Music” defines it as a “universal law of the perceptions obtained through the senses” (92). Attention must be paid to an object before it reaches the conscious mind. In “Notes on the history of Greek Philosophy etc.,” Hopkins describes the intense attention necessary to perceive, or contemplate, a complex object: “The more intellectual, less physical, the spell of contemplation the

IV. INSCAPE AND INSTRESS: THE NECESSITY OF ATTENTION

Hopkins’s first descriptions of the concepts of inscape and instress appear concurrently with these Oxford essays in his notes on Parmenides, written in the same notebook as “Notes on the history of Greek Philosophy” (JP 127). These notes reveal as much about Hopkins’s thought and his response to 19th-century philosophy—and theories of Perception—as they do about Parmenides. Hopkins reflects upon his ideas and uses his terminology, as might be expected in a student’s notes, to explicate the Greek philosopher. Hopkins finds Parmenides’s “feeling for instress, for the flush and fore drawn, and for inscape” as “most striking” (127). The “great text” of Parmenides, according to Hopkins, is “Being is, and Not-being is not” (127). Hopkins places this in his own words, perhaps “a little over-defining” Parmenides’ meaning, by indicating that this means “that all things are upheld by instress and are meaningless without it” (127). Inscapere and instress are strongly connected with perception¹⁰, and the notes on

more complex must be the object, the more close and elaborate must be the comparison the mind has to keep making between the whole and the parts, the parts and the whole” (JP 126). Complexity requires increasingly abstract, or “less physical,” contemplation. The more difficult an object is to know, or perceive, the more the observer relies upon subjective conclusions. Attention requires the influence of the mind,¹⁵ but Hopkins cautions against becoming distracted from the object. He calls close attention expressed in the “object”—this could also be called its inscape—as a “saner” mode of contemplation (126). Losing sight of what is “really” expressed by the object appears in the only instance of what Hopkins discusses, in a journal entry just three years after the Parmenides’ notes, as “false in stress” (March 1871, JP 204). “False in stress” appears to occur when the mind becomes taxed while concentrating with attention upon an object and the observer fails to comprehend the inscape. Hopkins writes that “what you look hard at seems to look hard at you, hence the true and the false in stress of nature” (204). When the mind fails to recognise the inscape of the object, when the object no longer “seems to look” back, the mind no longer correctly sees the object.¹⁶ He observes that “unless you refresh the mind from time to time you cannot always remember or believe how deep the inscape in things is” (204). Inscapes and in stress are dependent upon the object possessing a reality that is independent of the perceiving mind. This reality can be perceivable with intense attention; however, accurate knowledge of the object may still be uncertain if the perceiving mind is distracted or fatigued.

Every object has a uniqueness that is separate from the perceiving mind in Hopkins’s development of inscape and in stress. Hopkins had evolved an idea of Perception depended upon the interpretative power of the mind and the existence of an external world. Hopkins’s acceptance of an interpretation of Perception and sensation that incorporated both physiology and the subjective mind, however, does not allow easy access to the physical world. The insistence upon attention and intense contemplation of an object to grasp inscape only emphasises the immense difficulty of accessing the external world. In his poetry, Hopkins continues to be fascinated by the physiological process of vision, and, like most of his contemporaries, he relied upon visual Perception for knowledge. At the same time, several of his poems written between 1877 and 1883 reflect the difficulties encountered in perceiving the external world and question the reliability of vision despite the constraints, like attention, deemed necessary to prevent the subjective mind from fabricating in stress and so barring access to the external world.

The poems that the review will reveal an observer who closely follows the process of Perception, both physiological and subjective, and examines the implications of the attention required to unify the subjective portion of Perception with the reality of the object to experience its inscape. The first two poems, “The Lantern Out of Doors” and “The Candle Indoors” (1877–79), focus on how the attention is attracted and the difficulties experienced in sustaining attention. These first two poems emphasise the perceptual process by focusing on how an object garners attention; however, the observer and the subjective mind are ultimately central. The returns the poet to the problem expressed in his brief discussion of false in stress—neither the observer within the poem nor the poet himself can fully transcend the confines of the mind. “The Windhover” and “As kingfishers catch fire,” written about the same time, successfully divert the perceptual event away from the observer’s mind toward the object by framing inscape in language that concentrates upon the energy exchanged between the perceiving mind and the object. Although these poems, like “The Candle Indoors” and “The Lantern Out of Doors,” begin with an object arresting the observer’s attention. The observer and the object share the centre of the work. These two poems succeed in part because they carefully avoid too strictly analysing the Perception within the observer, whether physiological or subjective. As in “The Windhover” and “As kingfishers catch fire” sonnets, the physical properties of light assure that the limitations of the eye will not prohibit Perception. The observer may be unable to sustain attention, may have to contend with obstacles that bar easy access to the object, and may have to rely upon subjective interpretation; these limitations do not alter the medium between observer and object. If the observer can concentrate on the processes taking place between object and eye, the subjective mind appears to take on its proper role of ordering sensation for an accurate if the limited view of the external world.

Light and the mind: “The Lantern Out of Doors” and “The Candle Indoors.”

The companion sonnets, “The Lantern Out of Doors” and “The Candle Indoors,” begin with light-catching the speaker’s eye. Briefly, “The Lantern Out of Doors” describes a lantern that captures the eye of the speaker. He wonders who carries the lantern and where the lantern holder is going, but he is never able to see anything but the light of the lantern. The speaker’s thoughts then turn toward the many people whom he encounters but are unable to see for any length of time before he loses them to death or distance. The sonnet concludes with the consolation that these people are always, eternally within

sight of Christ. “The Candle Indoors” begins similarly: a candle at a window arrests the observer’s eye. The speaker again wonders about the person who is the source of the light. He considers whether the person for whom the candle burns glorify God “just for lack/Of answer.” Like the speaker in “The Lantern Out of Doors,” “The Candle” speaker cannot see the person who has lit the candle. In this poem, however, the speaker’s thoughts turn inward. The poet concludes that he should be more concerned with whether his own heart is glorifying God rather than idly wondering whether others are. Each sonnet begins with a precise material description of light and its motion. Hopkins does not limit the physical encounter with the lantern or candle—an experience that would be familiar to almost every reader—to the mere description of the material elements. He must place them in an accurate scientific context. Only then does he move toward a more subjective reflection upon the experience.

In the first quatrain of “The Lantern Out of Doors,” Lawler finds a split between the material (pure sense experience) of the lantern and a more formal recollection that involves wondering about some mystery (the “who goes there”). He describes the poem as moving from “the material visible to the spiritual conceptual” (225). “The Candle Indoors” follows a similar pattern as do many, if not all, of Hopkins’s sonnets.¹⁷ The reviewer may emphasise that Hopkins is moving beyond a mere description of the visual, and toward a conception of knowledge. The world might be that depends upon an accurate visual experience. He must attempt to grasp the inscape, the “being” of the candle flame that “puts blissful back” the “night is blear all black.” He attempts to accomplish this by close attention to the perceptual experience, attention informed by scientific analysis of physiological sensation. Ultimately, however, the speaker becomes focused on how his mind fails to manipulate the visual experience adequately. In each poem, the speaker can only form a clear picture of the light itself and not its bearer. The speaker then resorts to subjective invention regarding the source of the light. In each sonnet, the emphasis is upon the observer and his process of vision, and this causes the observer to be interested more in his mind and less in the object at hand.

In both poems, the speaker appears to be walking outside in the dark. Dark and black encircle the speaker—the “darkness wide” and “blear-all black” seem to cage the speaker and are reminiscent of “The Caged Skylark.” The object of the speaker’s vision at first appears to be the persons who have produced the light: he wonders “what task what fingers ply” by the light of the candle and “who goes there” with the lantern. The darkness, however,

prevents the poet from catching a glimpse of these persons; the only object he sees is the light emanating from the lantern or candle. Cotter observes that the proper object of inscape “that interests our eyes” in these companion sonnets is the light itself (200). The reader maybe with an image of a man “wondering” in a world of the dark at the light arresting his eyes. The object from which the light is projected is obscured; the only “clear” visual object is the light burning through the dark. The eye had long been regarded as an organ that processes light; the observer could be assured that the eye did actually process light, however many obstacles through which the light must pass. The light was something that could be scientifically analysed, measured, its rays and angles mathematically investigated. The only certainty rivets the poet “wondering,” “plodding” in the dark on his visual horizon.

Motion dominates the description of the light apprehending the observer: the lantern “moves along the night,” the candle “puts blissful back” the “night’s clear all black” and its “tram beams truckle at the eye.” Tyndall opens his work on sound by claiming “We have the strongest reason for believing that what the nerves convey to the brain is in all cases motion” (his emphasis; Sound 1). As an example, Tyndall then demonstrates this statement by describing how light is perceived: “It is the motion imparted by the sunbeams to the optic nerve which, when it reaches the brain, awakes the consciousness of light” (2). The “to-fro tram beams” that “truckle at the eye” may represent the rays of light moving back and forth from the eye as if they were running along train rails.¹⁸ Not only does Hopkins show the light beams or rays to be moving, but he has emphasised this element of visual sensation by placing either the observer or the object producing light in motion as well. There is constant activity, but it is not free motion. The light is also descriptive in ways that suggest it is moving through water; this recalls the fact that light moves in waves. In Hopkins’s time, light waves were expressive as moving through a substance called the ether¹⁹ that behaved like water, creating a metaphor that allowed the motion of light in waves to be apprehensive. The imagery of water is used to more significant effect in “The Lantern Out of Doors,” although the candlelight in “The Candle Indoors” possesses a “yellowy moisture” that pushes back the night. In “The Lantern Out of Doors,” the light is described as “wading” through the darkness. The light must move through obstacles before it reaches the eye—Hopkins carries this quality of light into the second quatrain as he compares the properties of light with the humanity that moves past him. He connects the light with

the inscape of man, the “beauty bright” that “makes” men “rare.”

Again, water imagery reminds the reader of the difficulty of light’s travel, and by extension, the obstacles encountered when one tries to grasp the inscape of anything in the external world, in this instance, another human being. The beams of man’s beauty “rain against our much-thick and marsh air.” Just as light and the information it carries travels through thick and viscous air, so too does man’s “mould or mind or what not else.” The poet is struggling to perceive the imperceptible. The mind is something that cannot be perceivable; the “what not else” may not even be named. There is a progression from what may be easily seen—a man’s form—to what may not be observable—his mind or other skills and talents. The poem has moved from what may be countable upon in visual sensation, the sensation of light, to that which may never be realisable, a man’s mind or other mysteries. The poet also has difficulty naming or identifying the person who must be the source of the light in “The Candle Indoors.” Unlike “The Lantern,” the speaker does not move to generalisations regarding man’s “beauty,” “mould,” or “mind”; the speaker in “The Candle” cannot even give the person who has lit the candle that much substance. The person who sits by the candle begins as “fingers” that “ply” and ends as the non-descript and unidentifiable “Jessy or Jack.” The inability to see the person behind the light leads to idle wondering “just for lack/Of answer.” The failure to see has turned the mind toward frivolous speculation.

After the failure to see in the octave, the sestet of “The Lantern Out of Doors” depicts the tortuous effort required to realise anything, and highlights the limitations of Attention and Perception. The speaker finds that

...wind

What most I may eye after, be in the end

I cannot, and out of sight is out of mind (l. 9–11).

Robert Bridges objected to the description of the eyes “winding” as “queer” (L I 66). Hopkins defended his choice by stating that the eye winds “only in the sense that its focus or point of sight winds and that coincides with a point of the object and winds with that” (L I 67). Although this may resolve the impossibility of winding as “a motion in and of the eyeballs,” it does not remove the convoluted syntax that completes the image. The twisting syntax emphasises the intricate path the eye must take to keep the object in sight. Remaining attentive requires willing the eye to follow an object beyond what seems natural.²⁰ The speaker not only finds it a struggle but despite best efforts and desire for success, must admit that “in the end”

attention may not be maintained. It is an impossibility to keep something within the sight indefinitely. The cliché “out of sight is out of mind” suddenly takes on a more literal and more powerful truth: that which is out of sight is literally out of mind. Once the mind becomes fatigued and may no longer attend to an object, the inscape is no longer within the observer’s grasp. The observer is left only with his thoughts, untouched by the external experience. The final tercet picks up the “mind” in the last line and turns it into a verb with Christ as the subject. Christ’s interest “eyes them” but Christ himself, in any physiological sense, does not eye them directly. Perfect attention must be metaphysical, in the sense of beyond the physical. Christ never puts men “out of mind,” instead he has no mind our understanding would comprehend. Again, the mind is a verb, not a noun here. The lack of the physiological in this tercet, however, simply emphasises the failure of the eye to see and the observer to perceive.

“The Candle Indoors” retreats even further from the external world: the eye does not attempt to “wind” after the object.²¹ If the object is unknowable, the speaker commands, concentrate on that which possesses a higher likelihood of being grasped, one’s own heart or inscape. The poem issues a call to return inside his own heart where he may be able to perceive something worthwhile for “You there is the master.” The last lines reveal, however, that even here blindness dominates. Although the speaker seems to desire to mend his “close heart’s vault,” it is closed. The final tercet accomplishes no close examination of the interior of the observer; instead, the speaker is left with questions:

What hinders? Are you beam-blind, yet to a fault?

In a neighbour deft-handed? are you that liar

Moreover, cast by conscience out, spend savour salt?

The obstacles remain. The “beam-blind” echoes the tram beams at the beginning of the poem and the passage in Matthew regarding plucking out a mote in a neighbour’s eye while ignoring the beam in one’s own. The “beam” is no longer an object that allows the speaker to escape from the confines of the mind, but an obstacle that “hinders.” The speaker is unable to transcend the mind and finds himself turning further inward only to find that there he is blind as well. The emphasis on “hindering” demonstrates that obstacles remain to clear sight, whether outside or inside oneself. In “The Candle,” attention directs the observer to the counter-productive activity of self-reflection, locking the observer within the darkness of his mind. The speaker in both poems finds himself focused upon his subjective impressions, unable to see anything clearly, including himself.

“Catching fire”: “The Windhover” and “As Kingfishers Catch Fire” (1877)

If “The Lantern Out of Doors” and “The Candle Indoors” fail to transcend the subjective mindfully, each poem represents an attempt to reconcile not only the material and the subjective, but the physical and the metaphysical as well. These two sonnets, as well as “The Windhover,” “As kingfishers catch fire,” and indeed the more significant portion of Hopkins’s body of work, portray the physical world as an appropriate means to probe metaphysical and spiritual matters. Throughout Hopkins’s poetry, the physical world proclaims the divine in the very details of its physicality. The material world, even the scientifically accurate material world, is not outside the realm of the metaphysical but is intimately connected to it in a way that is analogical to the inseparability of sensation and the mind in Perception. In this way, Hopkins’s work during this period may be seen as an answer to John Tyndall’s notorious “Belfast Address” of 1874.²² In this address, Tyndall describes the progress of science and emphasises the ascendancy of materialism in the present age. He aligns himself with materialism and sets himself against metaphysics and religion as an obstacle to scientific progress. Tyndall recounts that religion has been and can be dangerous to scientific culture and calls for a new form of religion that will satisfy the emotion and not limit science.²³ He asks religion to concede that the physical world—it should be noted that he even argues against any concept of a soul that is distinct from physical processes—is wholly within the jurisdiction of science alone:

All religious theories, schemes, and systems, which embrace notions of cosmogony, or which otherwise reach into its domain, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it. Acting otherwise proved disastrous in the past, and it is merely fatuous today. (216)

Hopkins, of course, disagreed. Tyndall’s address, although “interesting and eloquent,” made him “most mad” (Letters III 127). Hopkins criticises Tyndall’s history of science—“he [Tyndall] looks back to an obscure origin, he looks forward with the same content to an indefinite future”—and even speculates that the Darwinism that Tyndall invokes may not be what Darwin means. Hopkins also does not care for the ease with which Tyndall discards earlier authorities:

I notice that he has no sense of relative weights of authority: he quotes Draper, Whewell and other respectable writers for or against Aristotle, Bacon etc as if it were just the same things and you were keeping at the same level—

the Lord Chief Justice rules this way, his parlourmaid, however, says it should be the other and so on. (128)

For a man who had structured his life around submitting to both God and a disciplined religious community, Tyndall’s disregard of earlier authorities must have been particularly galling. Hopkins did not find authority limiting; how he combines the metaphysical and science in these poems demonstrates his willingness to address Tyndall’s admonition against religion and place scientific analysis on an equal footing with the metaphysical inquiry. In “The Lantern” and “The Candle” sonnets, the speaker finds that, despite his best efforts, he cannot transcend his subjective impressions. The sestet in these sonnets turn to God, to the metaphysical divine, and express the hope and belief that Christ may transcend the speaker’s failure. These two sonnets offer the hope, against Tyndall’s censure, that metaphysical analysis will provide more specific knowledge about the physical world. They do not, however, offer anything more than hope and the prevailing impression is that the speaker will always be lost within the world of his mind.

In the two sonnets, “The Windhover” and “As kingfishers catch fire,” Hopkins also begins with a description of the material world that may be strongly connected with physical science. “The Windhover” and “As kingfishers catch fire” focus on light and Perception as do the other two poems, but the light seems to be emitted from a perceivable object that directs the speaker’s attention. The sonnets remain focused upon these objects, and the speaker can describe them with great visual detail. Unlike “The Lantern Out of Doors” and “The Candle Indoors,” the sestet do not turn to Christ out of a failure to see, but because the speaker has been able to perceive the object’s inscape successfully. The successful Perception of inscape allows the speaker to glimpse the inscape of Christ; accurate perceptual analysis of the physical world reflects a metaphysical analysis as if they were two sides of the same coin. Hopkins’s religion does not limit his analysis of the physical world, despite Tyndall’s statements to the contrary, but promotes its success. “The Windhover” and “As kingfishers catch fire” manage to allow the perceiver to transcend the subjective mind and perceive both the physical and metaphysical object.

“The Windhover” has given rise to many different and conflicting readings, but the one thing with which most critics seem to agree is that it represents a successful description of the speaker recognising inscape.²⁴ The poem describes a windhover’s, or falcon’s, circling flight in detail; the bird’s delight especially strikes the speaker in flight and its seemingly effortless mastery of invisible air currents. The speaker finds, almost to his surprise, that his

“heart in hiding” is affected by the bird and in the sestet, he realises the falcon’s inscape which simultaneously releases a joyous and dangerous connection with Christ’s inscape. The poem ends with the reflection that all things, even ordinary things like dirt and black embers, have the potential to be escaped as well. “As kingfishers catch fire” also shows the successful realisation of inscape in the octave, although in this poem multiple objects are inscaped with a climactic inscaping of both Christ and man achieved in the sestet, where

...Christ plays in ten thousand places,

Lovely in limbs, and lovely in eyes, not his

To the Father through the features of men’s faces.

Successful inscape, as has been seen in Hopkins’s prose writings, is accomplished through a process of Perception that involves a union of the subjective mind and the physical reality of the object. The subjective mind does not change the object, but assists in the complete comprehension of its individuality, or its Nature as it exists externally to the perceiver.²⁵ In “The Lantern Out of Doors” and “The Candle Indoors,” the speaker’s emphasis on his close attention to the perceptual process has prevented the inscape of any object from being recognised. If inscape requires attention in Hopkins’s schema, how is a similar failure avoided in “The Windhover” and “As kingfishers catch fire”? The speaker in these two sonnets also follows the perceptual process, but the language chosen focuses upon an exchange between the object inscaped and the observer. The perceiver does recognise the inscape of an object, but only because of the object “fling[s] out broad its name.” Both perceiver and object are participating fully as inscape is apprehended by the speaker.

Both sonnets begin in a flurry of activity: everything is in motion, the birds, the air, dragonflies, indeed the inanimate stones tumble “over rim in roundy wells.” Even the tips of the windhover’s wings are “wimpling.” As in the “Lantern” and “Candle” sonnets, Perception begins with the sensation of motion. The only exception to the motion is the speaker’s “heart in hiding.” As in “The Lantern Out of Doors” and “The Candle Indoors,” “The Windhover” and “As kingfishers catch fire” show light as the dominant feature that attracts the speaker’s attention. The windhover is “morning’s minion, king- / dom of daylight’s dauphin.” The kingfisher catches “fire” and the dragonfly the kingfisher chases draws “flame.”²⁶ The movement, the light, the wind, and, in “As kingfishers catch fire,” the sound, again emphasises the wave motion of light, air and sound by which the perceiver receives his impressions.

Despite a chaotic impression, 19th-century science had shown that the measurable movement of waves orders the movement of sound and light. Wave motion allows the speaker to find a common way by which objects express their individuality and inscape. In “The Windhover,” the windhover’s flight is particularised by its “riding / Of the rolling level underneath him.” The bird can predict and control the waves of air that he encounters “reining” it with a “wimpling wing.” The language chosen indicates both passive and active effort on the part of the windhover to achieve this goal. The bird only “rebuffed the big wind” after a “hurl and gliding.” The falcon must both hurl itself into the wind and glide upon the air currents. This creature of the air cannot conquer the wind but must work with its motion to achieve flight. It is a motion. However, it might seem. Otherwise, that may be predicted; wave motion provides stability to the chaos of the physical world. Sensations may be perceived as motion, it may be challenging to determine the source of that motion as in “The Lantern” and “The Candle” sonnets, but the motion itself will be perceived by the sensations and the mind with equal clarity.

With everything in motion, the first verb in each of these two sonnets becomes even more significant: “I caught this morning, morning’s minion” and “As kingfishers catch fire.” As John Robinson has noted, “catching” for Hopkins is almost always associated with inscape.²⁷ The verb does not halt the action of the poem, as “caught” may imply, but initiates the movement of the poem. Catching is also, as Daniel Brown has noted, an activity that requires more than one participant. Something may only be caught if it is thrown. As a result, the use of the metaphor of catching “refutes the mutually excluding logic” that requires “that either subjective mind is subordinate to sense impressions or, vice versa, that sense intuitions are organised (or, for that matter, discredited) by mind” (Brown 290).²⁸ The “I caught” in the first line of “The Windhover” involves the observer more than the interpretation “caught a glimpse of” implies,²⁹ although this reading does highlight the suddenness that the windhover seems to come upon the speaker. James Finn Cotter suggests that the windhover is “caught and drawn by the poet’s inscape” (178), but this does not fully encompass the effect the bird’s inscape has upon the speaker. There is a meeting of inscapes: one must be prepared to catch something. The speaker has been in touch with his inscape (this may explain his “heart in hiding”); even though he may fail, his constant attention and striving for the inscape of objects has trained him to recognise it when it presents itself. The inscape of the windhover may come upon him suddenly, like a ball

thrown to someone unawares, but a person skilled in catching a ball will possess the reflexes to catch it.

The observer must be prepared and attentive to “catch” the inscape of the object; compare Tyndall’s comments as he tries to establish a “cohesion between thought and Light” in “The Scientific Use of the Imagination” (425). Here, Tyndall also emphasises preparation in the observer before he takes his reader “beyond the boundary of mere observation, into a region where things are intellectually discerned” and before he shows “the hidden mechanism of optical action.” Tyndall assumes that his readers are prepared by the “disciplines of common life” which are “exercises in the relations of space, or in the mental grouping of bodies in space; and, by such exercises, the mind is, to some extent, prepared for the reception of physical conceptions.” It is this preparation which enables the observer to utilise the imagination and so transcend the “domain of the senses.” Like Hopkins, Tyndall begins with the physical world and is therefore adequately prepared to move beyond it: “Urged to the attempt by sensible phenomena, we find ourselves gifted with the power of forming mental images of the ultra-sensible; and by this power, when duly chastened and controlled, we can lighten the darkness which surrounds the world of the senses” (425–26). Tyndall, against strict materialism, does allow for a movement beyond the world of the senses, for a “leap of the prepared imagination” (426).³⁰ Hopkins follows the very pattern Tyndall describes—close observation of the physical world that leads to a prepared mind—but he is enabled to form both accurate conceptions of the physical world and mental images of the “ultra-sensible” God, to catch the inscape of Christ. In Hopkins’s schema, the physical and the metaphysical are inseparable, and Tyndall’s scientific imagination remains valid for both.

“Catching” also allows the speaker to escape the problem of whether the impressions received are influenced by the mind more than the object. As the windhover must be both passive and active to ride the wind successfully, so too must the observer to “catch” the inscape of an object. The position of the speaker is less clear; the angle of vision is not chosen, and the subjective mind does not appear to be governing the Perception of the object. Rather “catch” allows the emphasis to be placed upon the moment when observer and object meet, upon the moment when knowledge is exchanged.³¹ The emphasis upon the moment of meeting further emphasises the communicative Nature of instress and inscape between perceiver and object.³² Everything in these two sonnets is in communication with something. The falcon is “dapple-dawn-drawn”: the bird seems to be drawn toward the dawning morning as well as drawing the dawn behind it.

This passage also seems to indicate that the windhover’s feathers reflect the dawn’s light in dappled patterns. This exchange of light is also seen in the flight of the kingfisher chasing after the dragonfly: “As kingfishers catch fire, dragonflies draw flame.” Each creature responds to another in a way that may release inscape. The stones, the strings, the bells that “fling out broad its name” require some stimulus—a boy throwing a stone in a well, a musician “tucking” a string, or someone ringing a bell—before they may deal “out that being indoors each one dwells.” This exchange, however, does not occur without stress, even violent stress. The stones must be thrown; they do not ring without tumbling “over rim in roundy wells.” The bells must be struck and the kingfisher and dragonfly exchange flame when each chases prey. The windhover’s inscape is revealed in its flight: a joyous flight, but one that requires the falcon to contend with a strong, buffeting wind. When two inscapes meet and reveal themselves, when a creature “selves” and cries “What I do is me: for that I came,” stress is released.³³ If inscape is that which makes each material object unique, two inscapes cannot exist in the same space, but instead butt against each other.

The notorious “Buckle!” of “The Windhover” may now be read as representative of that moment when inscapes meet. At this moment in the sonnet, the observer has realised, has touched the inscape of the bird and his inscape. Cotter has extended “Buckle” to also represent for the human observer “both exterior and inner experience, the fusion of being and thought in the moment of instress” and concludes that “Buckle” then “defines the coalescing action of inscape and instress” (181). Stress, fire, the flame is released at that moment just as surely as sparks fly when a hammer strikes an anvil and, for Hopkins, this is where Christ may be found: “AND the fire that breaks from thee then, a billion/Times told lovelier, more dangerous, O my chevalier!” Christ is the one who upholds inscape and allows it to be instressed or released, and in so doing, the observer may glimpse the inscape of Christ. The last images of the sonnet—“bluebleak embers, ah my dear, / Fall, gall themselves, and gash gold-vermilion”—demonstrate not only the possibility of inscape in the ordinary but also echo the sacrifice upon the cross in which Christ himself “served.”³⁴

If “The Windhover” provides a thorough description of inscape and instress as it occurs, “As kingfishers catch fire” defines the process in a more contemplative mood. In the sestet of this poem, the speaker takes on an authoritative tone and reflects how inscape is also released in man. After each object has solved in the octave with the climactic “What I do is me: for that, I came,” the speaker declares, “I say more.” The poem then finds inscape in the

just man and Christ who “keeps all his goings graces.” Here, the connection between God and the inscape of each creature is made more explicit: everything, particularly man, “Acts in God’s eye what in God’s eye he is.” Every creature, including man, behaves according to the unique purpose God has given. In this way, Christ exists and can be found in all creation; Christ’s existence is an integral part of the inscape, or of “that being indoors each one dwells,” of each physical object. As a result, “Christ plays in ten thousand places, / Lovely in limbs, and lovely in eyes, not his.” The moment when inscape is released may not be sustained, it may “flame out like shining from shook foil,” but it is dependent upon the prepared and attentive observer. The observer must be seeking inscape in the physical world, must be prepared to catch it, and must be prepared to allow both physical and metaphysical analyses to run together. In both sonnets, Hopkins has discovered a way in which the observer may focus on a moment that belongs neither to the observer or the object, but an instant in time when the energy of both meets in a flash of brilliant light. The problem of the subjective mind and external reality has been effectively avoided, and knowledge is realised in the waves of light or energy that connect the observer and object.

V. CONCLUSION

Eventually, it is often the case that the concept of inscape propounded by Hopkins, interacting with the approaches of perception in the scientific discourses of the nineteenth century. The pieces of evidence suggest that the problem of attention, an essential approach for the scientific world in the present Global scenario seems to be conducive to more reliable objective information or knowledge and it is apparent that this attention influenced the development of Hopkins’s inscape and it is demonstrated in the four poems: “The Candle Indoors,” “The Lantern out of the Doors” and then the sonnets: “The Windhover” and “As Kingfisher Catches Fire”, and it is possible to aim to fix the difficulties of sustaining attention for obtaining actual knowledge concerning the Physical and the metaphysical realities within nature and the Universe, created by the Ancient of Days.

REFERENCES

[1] Beer, Gillian. “Helmholtz, Tyndall, Gerard Manley Hopkins: Leaps of the Prepared Imagination”. Open Hopkins, Gerard Manley. The Correspondence of Gerard Manley Hopkins and Richard Watson Dixon (Letters II). Ed. Claude Collier Abbott. London: Oxford UP, 1935. Print.

Hopkins, Gerard Manley. “A Curious Halo.” *Nature*. November 16 1882. Print.

[2] Fields: Science in Cultural Encounter. Oxford: Clarendon Press, 1996. 242–72. Print.

[3] Brown, Daniel. Hopkins’ Idealism: Philosophy, Physics, Poetry. Oxford: Clarendon Press, 1997. Print.

[4] Christ, Carol. The Finer Optic. New Haven: Yale UP, 1975. Print.

[5] Cohen, William A. Embodied: Victorian Literature and the Senses. Minneapolis, MN: U of Minnesota P, 2008.

[6] Constantine Maria Concetta. “Hopkins and the Scientific Dilemma.” *RSV* 4 (1997): 85–103.

[7] Cotter, James Finn. Inscape: The Christology and Poetry of Gerard Manley Hopkins. Pittsburgh: U of Pittsburgh P, 1972. Print.

[8] Carry, Jonathan. Suspensions of Perception: Attention, Spectacle, and Modern Culture. Cambridge, MA: MIT Press, 1999. Print.

[9] Dale, Peter Alan. In Pursuit of a Scientific Culture: Science, Art, and Society in the Victorian Age. Madison: U of Wisconsin P, 1989. Print.

[10] Dau, Duc. “Hopkins and Bodies.” *Religion and Literature* 45.2 (2013): 178–84. Print. Lawler, Justus George. Hopkins Reconstructed: Life, Poetry and the Tradition. New York: Continuum, 1998. Print.

[11] Ellis, Virginia Ridley. Gerard Manley Hopkins and the Language of Mystery. Columbia, MO: U of Missouri P, 1991. Print.

[12] Gardner, W. H. Gerard Manley Hopkins: A Study of Poetic Idiosyncrasy concerning Poetic Tradition. 2 vols. London: Martin Secker and Warburg, 1948. Print.

[13] Grote, John. Exploration Philosophical. Vol. 1. 1865. Cambridge: Cambridge UP, 1900. 2 vols. Print.

[14] Hartman, Geoffrey. “The Dialectic of Sense-Perception.” Hopkins: A Collection of Critical Essays. Ed. Geoffrey H. Hartman. Englewood Cliffs, New Jersey: Prentice-Hall, 1966. 117–130. Print.

[15] Helmholtz, Hermann Ludwig Ferdinand von. “The Recent Progress of the Theory of Vision.” Trans. Dr Pye-Smith. 1868. Popular Lectures on Scientific Subjects. Trans. E. Atkinson. Introduction by John Tyndall. New York: D. Appleton and Company, 1873: 197–316. Print.

[16] Helmholtz, Hermann Ludwig Ferdinand von. Helmholtz’s Treatise on Physiological Optics. 1924. Trans and Ed. James P. C. Southall. 3 vols. New York: Dover, 1962. Print.

[17] Helmholtz, Hermann Ludwig Ferdinand von. “On the Physiological Causes of Harmony in Music.” Trans. A.J. Ellis. 1857. Popular Lectures on Scientific Subjects. Trans. E. Atkinson. Introduction by John Tyndall. New York: D. Appleton and Company, 1873: 61–106. Print.

[18] Hopkins, Gerard Manley. The Correspondence of Gerard Manley Hopkins to Robert Bridges (Letters I). Ed. Claude Collier Abbott. London: Oxford UP, 1935. Print.

[19] Hopkins, Gerard Manley. Further Letters of Gerard Manley Hopkins, Including His Correspondence with Coventry Patmore (Letters III). Ed. Claude Collier Abbott. 2nd ed. (revised and enlarged). London: Oxford UP, 1956. Print.

- [20] Hopkins, Gerard Manley. Gerard Manley Hopkins. Oxford Author Series. Ed. Catherine Phillips. Oxford: Oxford UP, 1986. Print.
- [21] Hopkins, Gerard Manley. The Journals and Papers of Gerard Manley Hopkins (JP). Ed. Humphrey House. Completed by Graham Storey. London: Oxford UP, 1959. Print.
- [22] Hopkins, Gerard Manley. The Sermons and Devotional Writings of Gerard Manley Hopkins (SD). Ed. Christopher Devlin. 1959. London: Oxford UP, 1967. Print.
- [23] Hopkins, Gerard Manley. "The Tests of a Progressive Science." Journals and Papers. Ed. Giuseppe Gaetano Castorina. Bari: Adriatica Editrice, 1975. 181–82. Print.
- [24] MacKenzie, Norman. A Reader's Guide to Gerard Manley Hopkins. Ithaca, NY: Cornell UP, 1981. Print.
- [25] Milward, Peter, S.J. A Commentary on the Sonnets of G.M. Hopkins. Chicago: Loyola Press, 1969. Print.
- [26] Milward, Peter, S.J. Landscape, and Inscape: Vision and Inspiration in Hopkins' Poetry. Grand Rapids: Eerdmans, 1975. Print.
- [27] Robinson, John. In Extremity: A Study of Gerard Manley Hopkins. Cambridge: Cambridge UP, 1978. Print.
- [28] Sprinkler, Michael. "A Counterpoint of Dissonance": The Aesthetics and Poetry of Gerard Manley Hopkins. Baltimore: Johns Hopkins UP, 1980. Print.
- [29] Turner, R. Steven. In The Eye's Mind: Vision and the Helmholtz-Herring Controversy. Princeton: Princeton UP, 1994.
- [30] Tyndall, John. "Address to the Meeting of the British Association of Belfast." The Academy. August 22 1874. 209–17. Print.
- [31] Tyndall, John. "Scientific Use of the Imagination." 1870. Fragments of Science: A Series of Detached Essays, Addresses and Reviews. 5th edition. New York: D. Appleton and Company, 1877. 423–457. Print.
- [32] Tyndall, John. Sound: A Course of Eight Lectures Delivered at the Royal Institution of Great Britain. 1866. New York: D. Appleton and Company, 1873. Print.
- [33] Whewell, William. The Philosophy of the Inductive Sciences, Founded Upon Their History. 2 vols. A Facsimile of the Second Edition, London, John W. Parker, West Strand. 1847.
- [34] The Sources of Science, No. 41. New York: Johnson Reprint Corporation, 1967. Print. White, Norman. Hopkins: A Literary Biography. Oxford: Clarendon Press, 1992. Print.
- [35] Zaninelli, Tom. "'An Attentive Observer': S.J. Perry, Hopkins' Scientific Mentor." Gerard Manley Hopkins and Critical Discourse. Georgia State Literary Studies: no. 11. New York: AMS Press, 1993. 325–30. Print.
- [36] Zaninelli, Tom. Hopkins in the Age of Darwin. Iowa City: U of Iowa P, 1988.
- [37] . "The Sources of Hopkins' Inscape: Epistemology at Oxford, 1864–1868." The Victorian Newsletter (Fall 1977): 18–24. Print.